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Title of the Invention: A Cosmetic Material

Application No. 60-122134

Application Date: 5 June 1985

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## SPECIFICATION

Title of the Invention: A Cosmetic Material

## Claim

A cosmetic material characterized in that the components of the cosmetic materials and soybean milk as the specific component are compounded and in that a surfactant is compounded in an amount of greater than 2 w % of the solid components in the soybean milk.

## Detailed Description of the Invention

## (Field of Industrial Use)

This invention relates to a cosmetic material in which soybean milk is compounded.

Soybeans are the seeds of the soybean plant, *Glycine max.* Merrill, of the family Leguminosae. It is important as a pure plant protein source. Further, bean curd (*tofu*), which is a processed product of it, is generally known as a food product that has a beautifying effect.

The inventors discovered through experimental work that soybeans not only serve as food products but that they are also effective in formulations for beauty culture for external use. In making products containing them on a commercial basis, their extracts, because they are aqueous extracts, are what is called "soybean milk," which is of a milky character. For this reason, cosmetic products in which soybean milk is used as the raw material have been provided and are widely used on the cosmetics industry and in the beauty industry.

## (Prior Art)

The subject of this invention is the emulsion (soybean milk) that is obtained by immersing soybean seeds in water to bring about swelling, after which they are ground, water is added, they are heated and the insoluble residue is separated by filtration. In general, soybean milk has a solids content of approximately 9% at pH 7.0 to 7.5 and is a white to yellow-tinged white milky substance. When a salt or acid is added and it is heated, it has the property of precipitating so-called bean curd [*tofu*], in which the protein is in a gelled, cheese-like state. Soybean milk contains 3 to 5% of protein and 3 to 5% of lipids. The protein has an excellent balance of amino acids, with a high lysine content, while the fat component has a high linoleic acid content. In addition, it contains many substances related to beauty culture such as hormones, phospholipids and vitamin E. In spite of the fact that it is presumed that it would be effective as a cosmetic product, there have been no reports [\*1] of its topical application. As a somewhat similar example, shampoos containing red beans, with the intentions of making use of the effect of saponins, shampoos in which black pigments are used and hair cosmetic products containing lecithin obtained by solvent extraction are known. Of legendary interest, there are tales of examples of such folk uses as milk baths and of whitening the face when washed with dregs (tofu refuse) of bean curd.

## (Action)

When the inventors used soybean milk as a cosmetic material, they found various effects that had not been anticipated.

## I) Effect of adding water

It is said that dry skin accelerates aging. Soybean milk, as a result of its constituents, has the actions of providing water and maintaining a suitable degree of water content. Table 1 shows the data obtained when it was applied to 20 users, the results being determined by a moisture meter, which determines the water content of the skin.

Table

	Control	Wiped with water	Wiped with soybean milk
Face			
After 30 minutes	19 ~ 26	22 ~ 29	23 ~ 28
After 2 hours	18 ~ 24	19 ~ 22	20 ~ 25
Upper arm			
After 30 minutes	23 ~ 32	25 ~ 30	26 ~ 32
After 2 hours	21 ~ 30	21 ~ 30	24 ~ 32
Palms			
After 30 minutes	16 ~ 24	18 ~ 26	20 ~ 30
After 2 hours	14 ~ 26	14 ~ 26	16 ~ 29

## II) Effect in providing a lustrous feel

After soybean milk has been applied to the skin or hair and it has been removed by bathing or shampooing, a moist lustrous feel is provided. A clearly different feel was experienced by subjects who did not undergo an application treatment. Although this feel cannot be expressed in terms of scientific data, a grasp of it can be obtained from user questionnaires. Table 2 shows the results when 1.9 liters of soybean milk was added to a household 180 liter bath tub and subjects bathed in it.

Table 2

Make-up of test subjects	Ages 6-12	Ages 13-18	Ages 19-26	Ages 27-36	Ages 36-56	Over Age 56	Totals
Males	3	7	8	9	23	9	59
Females	5	6	12	14	18	6	61
Totals	8	13	20	23	41	15	120

## Questionnaire Results

	Good		Medium		Impossible		No response	
Bathing	Bath had a fine texture	77	No different from ordinary	10	Not possible	12	Don't know	21
During bath	Good warmth	90	No particular difference	3	Bad feeling	9	No answer	18
Washing with soap	Good foaming	86	No particular difference	14	Dirt wouldn't come off	4	Not sure	16
Feeling on getting out of bath	Felt warm	94	No particular difference	9	Bad feel	10	Don't know	7
Feel of skin	Smooth feel	38	Can't say anything particular	4	Didn't feel clean	2	Not clear	4
	Moist feeling	35			Feeling of dirt left behind	3		
	Luxurious feeling	25			Sticky feeling	9		

When soybean milk was compounded during shampooing of hair, there was perception of glare when hair grooming materials were applied subsequently and the hair was glossy.

### III) Action in eliminating dirt

Oleaginous components, saponin and lecithin are mixed with soybean milk and serve to eliminate hydrophilic and lipoid dirt. When the inventors used it in combination with soap, there was good foaming and release of dirt. When the wash water was observed under the microscope, it was seen that microparticles of soybean milk had surrounded the dirt particles. When this action was considered, we concluded as follows. Hair and skin in vivo have a pH on the acidic side of 3.5 to 5.0. When stable soybean colloid of a pH of 7.0 to 8.0 comes into contact with acidic substances, the soybean colloid particles incorporate them and become enlarged. When there is a large quantity of acidic substances and the balance breaks down, there is agglutination to a bean curd-like scum. However, this is dispersed by an activator and the dirt is removed in the previous step.

Experiment [NOTE: This seems to be a typographical error for "test material"] A: Face powder (compounded pigment, 80.0%; sorbitol, 4.0%; sorbitan sesquioleate, 10.0%; vaseline, 0.5%; liquid paraffin, 2.0%; propylene glycol, 2.5%; castor oil, 1.0%) was applied in a fixed amount to a glass slide to make a test strip. The test materials [NOTE: Translator is assuming a typographical error in which "experiment" is used instead of "test material"] consisting of the formulated product of Example 1 (A) and of a formulated product (B) from which 100.0% of the soybean milk had been removed were immersed in dilute solutions of 10 times

their volume in which they were agitated for 30 minutes. The test strips were removed and washed with water 5 times. When the glass slide prepared previously was taken as the standard and the ratios of light transmittance were compared, the following results were obtained.

A: 97.7%

B: 82.1% [\*2]

#### IV) Other effects

As discussed previously, because soybean milk contains many essential amino acids, fatty acids, lecithin and vitamins, when it is applied externally to the body, it is anticipated that it will have the effects of maintaining the scalp, hair and skin in a healthy state.

#### V) Toxicity

Soybean milk has not exhibited any toxicity whatsoever when consumed as a beverage. Eight women washed their faces with a 10-times dilution of soybean milk every morning over a period of 92 days, with no abnormalities whatsoever being found.

Although the effects of soybean milk described above were observed, the first problem in their actual use as cosmetic products that contain them relates to spoilage and degeneration. This problem can be resolved by the addition of suitable chemical substances and by sterilization.

The second problem is the production of dregs (bean curd-like, soft solid matter, hereafter referred to as scum). Specifically, the fact that soybean milk has the property of solidifying during heating in the presence of electrolytes is known. When this process occurs to an extent at which the particles grow in size and join without reaching the point of solidification, it is characterized by the fact that dirt components undergo inclusion and are removed. However, under conditions in which there is a marked change in the degree of this process, for example, in the case in which large amounts of acidic substances such as perspiration remain, in the case in which large amounts of makeup are attached or in the case in which hard water or seawater is used, then a state of solidification develops and so-called scum forms and remains on the skin or hair. Even if the scum itself does not exhibit any particularly deleterious effect physiologically without being washed off, the scum remains attached and the individual cannot appear in public. Consequently, in cosmetic products, a means must be devised so that scum is not generated and solidified.

The inventors discovered that the addition of surfactants was a specific method for solving this problem.

As indicated above, undiluted soybean milk has a high water content. Therefore, considering the points both of convenience of handling and degeneration, the use of dry product is desirable. The following is a typical example of analysis of dry soybean milk product: protein, 40-45%; fat, 15-18%; carbohydrates, 30-35%; ash content, 4-5% and water content, 2 to 10% are common. [\*3]

Experiment B: 10 ml of commercial soybean milk [no additions: evaporation residue, 9.14% (105°, 2 g, 3 hours)] was placed in a beaker and 20 ml of water and various stepped quantities of surfactant were added. Next, 10 ml of a N/10 solution of  $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$  was added to make a total volume of 50 ml and the mixture was heated over a hot bath for 30 minutes. It was filtered with filter cloth, and, after 5 minutes of draining off of water, the scum (containing water as is) remaining on the filter cloth was weighed. The results are shown in the figure.

In the figure, [A] shows the case in which surfactant was not added and in which formation of more than 10 g of scum was seen. [B] shows the case in which  $\text{CaCl}_2$  was not added. When the surfactants [W, X, Y and Z] were added, formation of scum could be inhibited to a certain extent. The raw materials that were used for the symbols in the table are indicated below.

W: Nonionic type (polyoxyethylene nonyl phenol ether)

X: Cationic type (tetradecylamine acetate)

Y: Bi-ionic type (dimethylalkyl betaine) [Translator's Note: In the figure, this is indicated as amphoteric.]

Z: Anionic type: (potassium stearate soap)

The greatest effect was found for the nonionic type, with an effect being found with greater than 0.2 w % relative to the soybean milk, i.e., an amount corresponding to 2 w % of the solid component of the soybean milk.

However, when a large quantity of  $\text{CaCl}_2$  was present, scum precipitated. Therefore, it was necessary to increase the quantity of surfactant. In addition, the combined use of complexion agents was also effective.

In analyzing cosmetic products containing surfactants and soybean milk of this invention, the surfactants were analyzed by ordinary methods. For the soybean milk,  $\text{BaCl}$  was added in a quantity equal to or greater than the quantity of soybean milk, and the mixture was boiled, the difference between the dried quantity of precipitate and the ash content was weighed, and, at the same time, soybean milk was subjected to the same procedure. Quantitative determination was performed by comparing the findings.

#### Example 1

##### Shampoo formulation

a	Soybean milk (solid matter content, 8.74%)	10.0 W%
b	Sodium polyoxyethylene lauryl ether sulfate	30.0
c	Polyoxyethylene polyoxypropylene lanolin	2.0
d	Distearic acid ethylene glycol	1.5
e	Glycerol	4.0
f	Paraben (methyl, ethyl)	0.3
g	Lauric acid diethanolamide	5.0
h	Benzyl alcohol hydrochloride	0.1
i	Sodium edetate	0.1
j	Carboxymethyl cellulose Na	1.0
k	Fragrances and pigments	g. s
l	Purified water	45.9

j was added in advance to 20 times its volume of purified water and was dissolved by heating and stirring. Next, b through e were added, a solution in which a, g and i and the remaining purified water had been added separately was added and was heated in the vicinity of  $70^\circ\text{C}$  and was filtered with bleached cotton cloth. f, h and k were then mixed, with the product being obtained. This product was a shampoo for hair washing having pale yellow bar-shaped microcrystals and luster. Hair oil was completely washed off without loss of hair quality. When it was dry blown after washing with water, the hair had a moist feel. No solidified scum whatsoever was found, and, consequently, no flakes of dirt were attached after washing of the hair.

## Example 2

## Example of cold cream

a	Soybean milk (solid matter content, 9.07%)	5.0 W%
b	Paraffin	5.0
c	Lanolin	3.0
d	Isopropyl myristate	6.0
e	Squalane	3.0
f	Mineral oil	25.0
g	Castor oil	5.0
h	Polyoxyethylene sorbitan monostearate	2.0
	Sorbitan monostearate	5.0
j	Paraben	0.2
k	[illegible] acid anilide	0.3
	boric acid	0.3
m	Fragrances	0.2
n	Purified water	40.0

b through h were mixed to make A and a, i to l and m were mixed to make B. The two mixtures were heated to 50°C and A was introduced into B. Next, n was added and was thoroughly kneaded, with a cream being made. When this product was applied to the skin, it provided a refreshing feeling. The texture of the cream was fine and had a good feeling and there was no separation. On observation under the microscope, the particles were found to be uniformly ordered and scum was not produced during storage.

## Example 3

## Example of lotion (for use on dry skin)

a	Soybean milk (solid matter content, 9.07%)	3.5 W%
b	Stearic acid	2.0
c	Liquid paraffin	0.5
d	Sorbitol (70%)	2.0
e	Glycerol	2.0
f	Polyoxyethylene sorbitol monolaurate	1.5
g	Triethanolamine	0.2
h	Zinc phenolsulfonate	0.5
i	Hexachlorophene	0.2
j	Na edatate	0.5
k	Fragrances	suitable quantity
l	Purified water	add to make 100

a to l were mixed, a vial was filled with the mixture and was hermetically sealed to make the product. This product was a vanishing hand lotion containing soybean milk. Housewives and domestic workers who handle water in their occupations lose water-soluble components in the stratum corneum with the result that their skin tends to dry out. This product has the objective of supplementing this moisture by means of components containing soybean milk. Emulsified particles of soybean milk form large pieces of scum so that the effect is lost. Therefore, dispersion as fine particles is achieved by compounding f and other components.

#### Example 4

##### Example of hair lotion (rinse)

##### Formulation

	Soybean milk powder [*5] (solid matter content, 92 w%)	5.0 W%
<b>b</b>	Polyoxyethylene nonyl phenyl	1.0
<b>c</b>	Lecithin	0.2
<b>d</b>	Castor oil	2.0
<b>e</b>	Olive oil	2.0
<b>f</b>	Na alginate	0.1
<b>g</b>	Alcohol (90%)	40.0
<b>h</b>	Cayenne pepper tincture	1.0
	T oil	0.2
<b>j</b>	Paraben	0.2
<b>k</b>	Purified water	48.3

First, f was heated to 50°C and thoroughly dissolved in g and k in that order and a, b, c, j, h, i, d and e were mixed in that order. In general, when this type of alcohol is used as a base, the large quantities of c, d and e that are compounded undergo separation. However, by the compounding of a and b, an emulsified state is formed and stabilization is effected. This product prevents dryness of the hair, makes it pliable and prevents the occurrence of dandruff and itching.

It is particularly effective for the protection of hair that has undergone permanent waves and hair dyeing treatment. Specifically, these treatment chemicals are present in minute quantities after washing of the hair and damage hair quality. By making a lotion with this product, the treatment chemicals act with the soybean milk so that the health of the hair is protected.

#### Example 5

##### Example of bath agent

	Soybean milk (solid matter content, 14.7%)	60.0 W%
<b>b</b>	Na lauryl sulfate	5.0
<b>c</b>	Polyoxyethylene nonyl phenol	5.0
<b>d</b>	Hexamine	0.5
<b>e</b>	4 Na edetate	0.5
<b>f</b>	Gentian violet (can be substituted by other pigments)	0.5
<b>g</b>	Fragrances	0.5
<b>h</b>	Purified water	28.83

a through h were mixed and packed into a vial to make the product. 180 ml of this product is used at one time in a 180 liter household bath tub. When the quantity used is increased, marked foaming occurs and it serves as a Western style or special bathing agents and bath scum is not produced during bathing.

##### (Effect)

This invention can be used for a wide range of cosmetic products, that is, for hair washing and hair cosmetic products such as shampoos and rinses, for general toilet water products such as after shaving lotions and hand lotions, for cream emulsions such as cleansing creams, shaping creams and cold creams, cosmetic materials for packs, foundations, cosmetic products for bathing, face washing materials and soaps. After use, it is effective in making the skin and hair clean and moist and maintaining them in sound health.

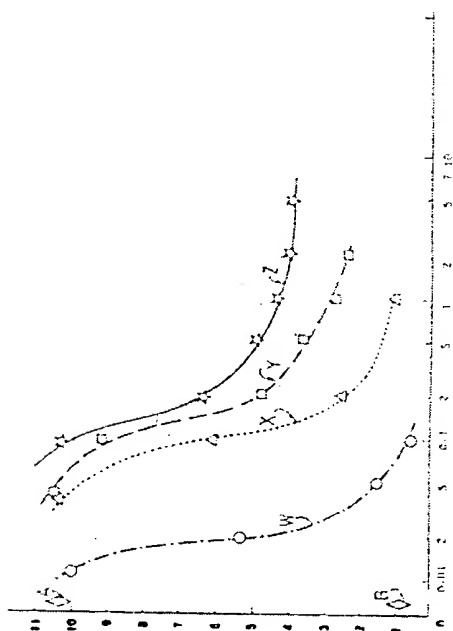
### Brief Explanation of the Figure

The figure is a graph presenting the experimental values indicating the effectiveness of the addition of surfactants for the purpose of inhibiting formation of soybean milk scum. The horizontal axis shows the amount of increase in surfactant and the vertical axis shows the amount of scum produced.

The experimental conditions are described in the detailed description.

- A: Case in which surfactant was not added and  $\text{CaCl}_2$  was added.
- B: Case in which surfactant was not added and  $\text{CaCl}_2$  was also not added.
- W: Case in which a nonionic surfactant was added.
- X: Case in which a cationic surfactant was added.
- Y: Case in which an amphoterics catalyst was added
- Z: Case in which an anionic surfactant was added

Applicant: Kashiwa Chemical Industries, Ltd.



[vertical axis]: Amount of scum formed (g)  
[horizontal axis]: Quantity of surfactant added (g)

[Translator's Note: The Specification is followed by three Amendments. They are described separately below.]

### Voluntary Amendment of 16 July 1986

This amendment has five provisions which are indicated in the translation in brackets at their points of occurrence. These changes have been incorporated into the translation.

- [\*1] This amendment provides for correction of an incorrect kanji character.



This amendment provides for changing "A" and "B" in the upper right quadrant of page (3) of the Japanese text to their Japanese kanji equivalents. The translator has elected to retain "A" and "B" as written.

This amendment provides for insertion of a paragraph.

This amendment provides for correction of an incorrect kanji character.

- [\*5] This amendment provides for addition of the word "powder" after soybean milk.

#### Amendment of 5 September 1986

This amendment states that it provides for a change in the Amendment of 16 July 1986 and that the change is presented on a separate page.

#### Amendment of 16 July 1986

This amendment states that it provides for a change in the Amendment of 16 July 1986 and that the change is presented on a separate page.

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